

871TM 3-wire DC Short Barrel Tubular Sensors



871TM Cable Style
12 mm, 18 mm, and 30 mm Diameter



871TM Mini Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter



871TM DC Micro Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter

Specifications

Attribute	12 mm, 18 mm, and 30 mm Diameter
Load current	≤ 200 mA
Capacitive load	≤ 1 μF
Leakage current	≤ 10 μA
Operating voltage	10...30V DC
Voltage drop	≤ 1V DC at 200 mA
Repeatability	≤ 10% at constant temperature
Hysteresis	10% typical
Protection type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	UL Listed, CSA Certified, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations
Enclosure type rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13 IP67 (IEC529) all models; 1200 psi (8270 kPa) washdown; ToughLink™ and micro connector versions are also rated IP69K (IEC 529)
Housing material	Stainless steel face and threaded barrel
Connection type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length, A2 - 3-conductor PVC, C2 - 3-conductor 22 AWG-ToughLink, H2 - 3-conductor 18 AWG ToughLink Quick disconnect: 4-pin mini style, 4-pin M12 micro style
Status indicators	<ul style="list-style-type: none"> Red: Output energized Green: Power/short circuit (flashing) – 18 mm models only
Operating temperature	-25...+70 °C (-13...+158 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

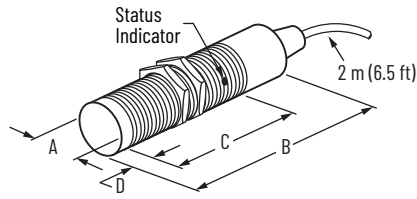
Target Material	Correction Factors
Steel	1.0
Stainless steel	0.9...1.0
Brass	0.3...0.5
Aluminum	0.1...0.4
Aluminum (≤ 0.02 thick)	0.9...1.1
Copper	0.1...0.2

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency [Hz]	Cat. No.			
						PVC Cable	ToughLink Cable	Mini QD Style	M12 Micro QD Style
12 (0.47)	2 (0.08)	Yes	N.O.	NPN	75	871TM-DH2NN12-A2	871TM-DH2NN12-C2	871TM-DH2NN12-N4	871TM-DH2NN12-D4
				PNP		871TM-DH2NP12-A2	871TM-DH2NP12-C2	871TM-DH2NP12-N4	871TM-DH2NP12-D4
	4 (0.16)	No	N.O.	NPN	70	871TM-DH4NN12-A2	871TM-DH4NN12-C2	871TM-DH4NN12-N4	871TM-DH4NN12-D4
				PNP		871TM-DH4NP12-A2	871TM-DH4NP12-C2	871TM-DH4NP12-N4	871TM-DH4NP12-D4
	2 (0.08)	Yes	N.C.	NPN	75	871TM-DH2CN12-A2	871TM-DH2CN12-C2	871TM-DH2CN12-N4	871TM-DH2CN12-D4
				PNP		871TM-DH2CP12-A2	871TM-DH2CP12-C2	871TM-DH2CP12-N4	871TM-DH2CP12-D4
	4 (0.16)	No	N.C.	NPN	70	871TM-DH4CN12-A2	871TM-DH4CN12-C2	871TM-DH4CN12-N4	871TM-DH4CN12-D4
				PNP		871TM-DH4CP12-A2	871TM-DH4CP12-C2	871TM-DH4CP12-N4	871TM-DH4CP12-D4
18 (0.71)	5 (0.2)	Yes	N.O.	NPN	60	871TM-DH5NN18-A2	871TM-DH5NN18-H2	871TM-DH5NN18-N4	871TM-DH5NN18-D4
				PNP		871TM-DH5NP18-A2	871TM-DH5NP18-H2	871TM-DH5NP18-N4	871TM-DH5NP18-D4
	8 (0.31)	No	N.O.	NPN	40	871TM-DH8NN18-A2	871TM-DH8NN18-H2	871TM-DH8NN18-N4	871TM-DH8NN18-D4
				PNP		871TM-DH8NP18-A2	871TM-DH8NP18-H2	871TM-DH8NP18-N4	871TM-DH8NP18-D4
	5 (0.2)	Yes	N.C.	NPN	60	871TM-DH5CN18-A2	871TM-DH5CN18-H2	871TM-DH5CN18-N4	871TM-DH5CN18-D4
				PNP		871TM-DH5CP18-A2	871TM-DH5CP18-H2	871TM-DH5CP18-N4	871TM-DH5CP18-D4
	8 (0.31)	No	N.C.	NPN	40	871TM-DH8CN18-A2	871TM-DH8CN18-H2	871TM-DH8CN18-N4	871TM-DH8CN18-D4
				PNP		871TM-DH8CP18-A2	871TM-DH8CP18-H2	871TM-DH8CP18-N4	871TM-DH8CP18-D4
30 (1.18)	10 (0.39)	Yes	N.O.	NPN	40	871TM-DH10NN30-A2	871TM-DH10NN30-H2	871TM-DH10NN30-N4	871TM-DH10NN30-D4
				PNP		871TM-DH10NP30-A2	871TM-DH10NP30-H2	871TM-DH10NP30-N4	871TM-DH10NP30-D4
	15 (0.59)	No	N.O.	NPN	30	871TM-DH15NN30-A2	871TM-DH15NN30-H2	871TM-DH15NN30-N4	871TM-DH15NN30-D4
				PNP		871TM-DH15NP30-A2	871TM-DH15NP30-H2	871TM-DH15NP30-N4	871TM-DH15NP30-D4
	10 (0.39)	Yes	N.C.	NPN	40	871TM-DH10CN30-A2	871TM-DH10CN30-H2	871TM-DH10CN30-N4	871TM-DH10CN30-D4
				PNP		871TM-DH10CP30-A2	871TM-DH10CP30-H2	871TM-DH10CP30-N4	871TM-DH10CP30-D4
	15 (0.59)	No	N.C.	NPN	30	871TM-DH15CN30-A2	871TM-DH15CN30-H2	871TM-DH15CN30-N4	871TM-DH15CN30-D4
				PNP		871TM-DH15CP30-A2	871TM-DH15CP30-H2	871TM-DH15CP30-N4	871TM-DH15CP30-D4
Recommended standard QD cordset: -6F = 1.8 m (6 ft), -2 = 2 m (6.5 ft)								889N-F4AFC-6F	889D-F4AC-2

Approximate Dimensions

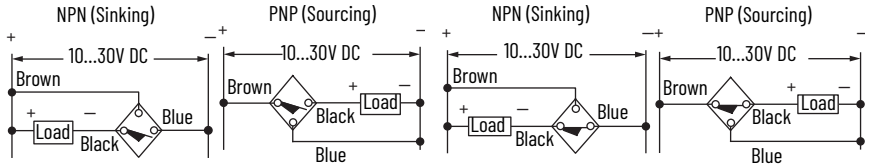
Cable Style



Wiring Diagrams

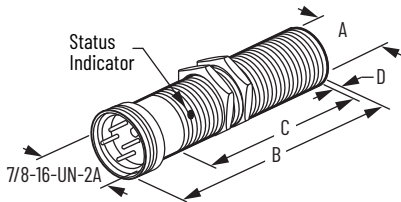
Normally Open

Normally Closed



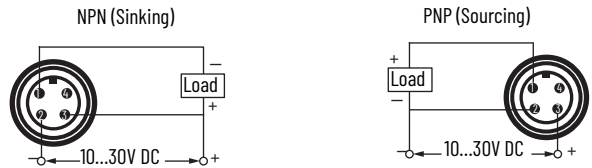
Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	49.8 (1.96)	26.4 (1.04)	2.5 (0.1)
	No			19.5 (0.77)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.1)
	No				14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

Mini QD Style



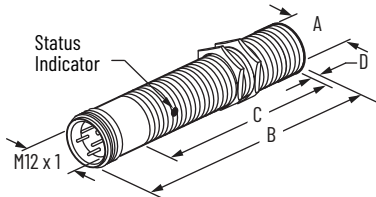
Normally Open

Normally Closed



Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	63.5 (2.5)	25.4 (1)	2.5 (0.1)
	No			18.5 (0.73)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.1)
	No			29.2 (1.15)	14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	68.1 (2.68)	41.9 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

M12 Micro QD Style



Normally Open or Normally Closed



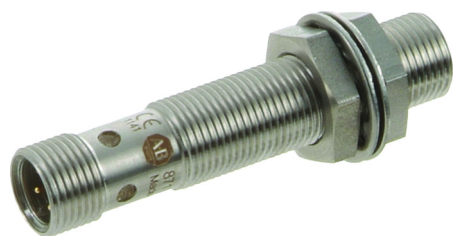
Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	61.5 (2.4)	26.4 (1.04)	2.5 (0.1)
	No			28 (1.1)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	65.1 (2.56)	41.7 (1.64)	2.5 (0.1)
	No				14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	66.3 (2.61)	41.9 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

871TM 3-wire DC Weld Field Immune Tubular Sensors

Specifications



871TM DC Pico Quick Disconnect Style
8 mm



871TM DC Micro Quick Disconnect Style
12 mm



871TM DC Micro Quick Disconnect Style
18 mm

Attribute	8 mm, 12 mm, and 18 mm
Load current	≤ 200 mA
Leakage current	≤ 0.1 mA
Operating voltage	10...30V DC
Voltage drop	≤ 2V DC at 200 mA
Repeatability	≤ 5% at constant temperature, maximum sensing range
Hysteresis	15% typical
Protection type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	cULus Listed, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations
Enclosure type rating	IP68/IP69K
Housing material	Stainless steel face and threaded barrel, resistant to weld splatter
Connection type	Quick disconnect: 4-pin micro style, 3-pin Pico style
Status indicators	Yellow: Output energized/360° visibility flashing status indicator indicates target that is located between 80...100% of rated sensing distance
Operating temperature	-25...+85 °C (-13...+185 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes
Weld field Immunity	≤ 40 mT (400 Gauss)

Correction Factors

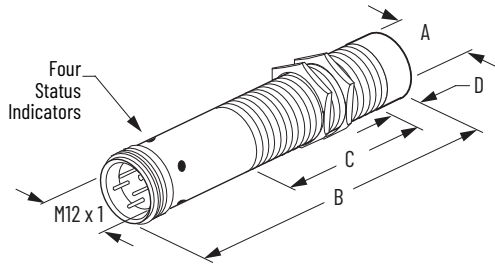
Target Material	Barrel Size and Sensing Range		
	M8	M12	M18
	3 mm	6 mm	10 mm
Steel	1.00		
Copper	1.00	0.85	1.15
Aluminum	1.00	1.00	1.40
Brass	1.30	1.30	1.50
Stainless steel (1 mm/2 mm)	0.4/0.70	0.5/0.90	0.1/0.6

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency [Hz]	Cat. No.	
						Pico QD Style	Micro QD Style
8 (0.31)	3	Yes	N.O.	PNP	≤ 15	871TM-MW3NP8-P3	—
12 (0.47)	6	Yes	N.O.	PNP		—	871TM-MW6NP12-D4
18 (0.71)	10	Yes	N.O.	PNP		—	871TM-MW10NP18-D4

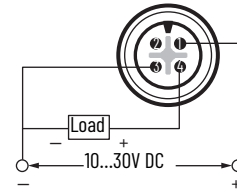
Approximate Dimensions

Micro QD Style



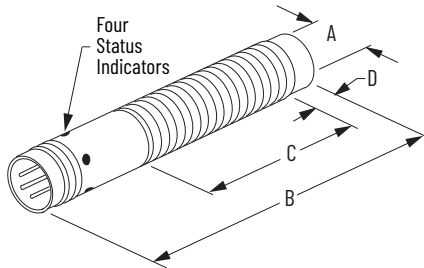
Wiring Diagrams

Normally Open

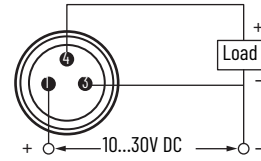


Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	60 (2.36)	41 (1.61)	—
M18 x 1	Yes	18 (0.71)	63.5 (2.5)	42.5 (1.67)	—

Pico QD Style



Normally Open



Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M8 x 1	Yes	8 (0.31)	60 (2.35)	45.5 (1.79)	—

871TM 3-wire DC Standard Range Tubular Sensors



Specifications

Attribute	12 mm, 18 mm, and 30 mm Diameter
Load current	≤ 200 mA
Capacitive Load	≤ 1 mF
Leakage current	≤ 0.1 mA
Operating voltage	10...30V DC
Voltage drop	≤ 2V DC at 200 mA
Repeatability	≤ 5% at constant temperature
Hysteresis	10% typical
Protection type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	cULus Listed, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations
Enclosure type rating	12 mm, 18 mm, 30 mm diameter models: IP68/IP69K
Housing material	Stainless steel face and threaded barrel
Connection type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length Quick disconnect: 4-pin micro style
Status indicators	Yellow: Output energized/360° status indicator visibility, flashing status indicator indicates target that is located between 80...100% of rated sensing distance
Operating temperature	-25...+70 °C (-13...+158 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes
IO-Link (Enabled on Normally Open, PNP Models Only)	
Protocol	IO-Link V1.1
Interface Type	IO-Link
Mode	COM2 (38.4 kBd)
Cycle Time, min ⁽¹⁾	8 ms
SIO (Standard I/O)	Supported (pin 4 for either IO-Link or standard I/O)

(1) These products have been tested to comply with IO-Link test specification IEC 61131-9. Environmental EMC and Physical Layer testing have not been performed with the device running in IO-Link mode.

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency [Hz]	Cat. No.	
						M12 Micro QD Style	PUR Cable Style
12 (0.47)	3 (0.12)	Shielded	N.C.	NPN	100	871TM-M3CN12-D4	—
				PNP		871TM-M3CP12-D4	—
			N.O.	NPN		871TM-M3NN12-D4	871TM-M3NN12-A2
				PNP		871TM-M3NP12-D4	871TM-M3NP12-A2
	4 (0.16)	Unshielded	N.C.	NPN	100	871TM-N4CN12-D4	—
				PNP		871TM-N4CP12-D4	—
			N.O.	NPN		871TM-N4NN12-D4	871TM-N4NN12-A2
				PNP		871TM-N4NP12-D4	871TM-N4NP12-A2
18 (0.71)	5 (0.2)	Shielded	N.C.	NPN	100	871TM-M5CN18-D4	—
				PNP		871TM-M5CP18-D4	—
			N.O.	NPN		871TM-M5NN18-D4	871TM-M5NN18-A2
				PNP		871TM-M5NP18-D4	871TM-M5NP18-A2
	8 (0.31)	Unshielded	N.C.	PNP	100	871TM-N8CP18-D4	—
				NPN		871TM-N8NN18-D4	871TM-N8NN18-A2
			N.O.	PNP		871TM-N8NP18-D4	871TM-N8NP18-A2
				NPN		871TM-N8NN18-D4	871TM-N8NN18-A2
30 (1.18)	10 (0.39)	Shielded	N.C.	PNP	50	871TM-M10CP30-D4	—
				NPN		871TM-M10NN30-D4	871TM-M10NN30-A2
			N.O.	PNP		871TM-M10NP30-D4	871TM-M10NP30-A2
				NPN		871TM-M10NN30-D4	871TM-M10NN30-A2
	15 (0.59)	Unshielded	N.C.	PNP	50	871TM-N15CP30-D4	—
				NPN		871TM-N15NN30-D4	871TM-N15NN30-A2
			N.O.	PNP		871TM-N15NP30-D4	871TM-N15NP30-A2
				NPN		871TM-N15NN30-D4	871TM-N15NN30-A2

Correction Factors

Instructions for unshielded sensor:

- To determine the appropriate correction factor, only use [Table 4](#).
- To determine derated sensing distance (if applicable), multiply the sensor type with the target material by the sensing range.

Instructions for shielded sensor:

- To determine the appropriate correction factor, use [Table 4](#) and [Table 5](#).
- In [Table 4](#), determine the appropriate correction factor, based on the type and the target material.
- In [Table 5](#), multiply the result from [Table 4](#) by the material the sensor is mounted in. The result is the final correction factor.

Table 4 - Sensor Type and Target Material Correction Factor

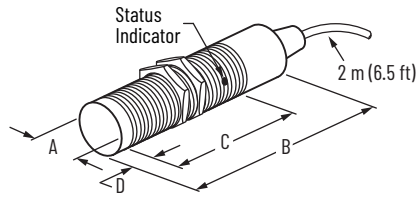
Sensor Type/ Target Material (No Surrounding Metal)	M12		M18		M30	
	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded
Steel	1.0	1.0	1.0	1.0	1.0	1.0
Copper	0.9	0.9	0.8	0.9	0.7	0.9
Aluminum	1.1	1.0	1.0	1.1	1.1	1.1
Brass	1.5	1.3	1.3	1.4	1.3	1.4
Stainless steel (1 mm)	0.2	0.2	0.6	0.4	0.8	0.3
Stainless steel (2 mm)	0.6	0.6	0.8	0.8	0.9	0.6

Table 5 - Surrounding Material

Surrounding Material Type	M12	M18	M30
Steel	1.0	1.0	0.9
Aluminum	0.9	0.9	0.9
Brass	0.9	0.9	0.8
Stainless steel	0.9	0.9	0.9

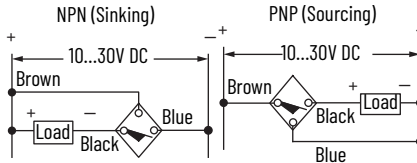
Approximate Dimensions

Cable Style

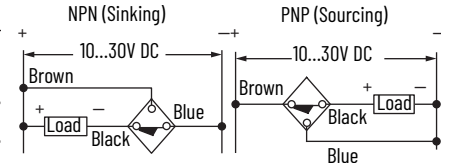


Wiring Diagrams

Normally Open

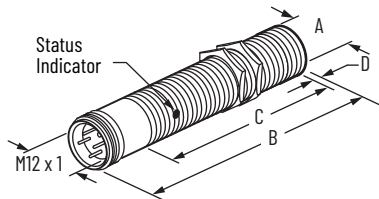


Normally Closed

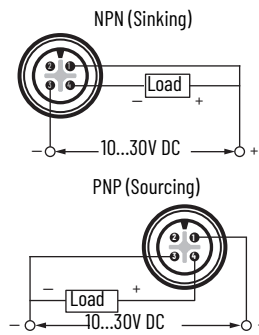


Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	50 (1.97)	50 (1.97)	—
	No			45 (1.77)	5 (0.2)
M18 x 1	Yes	18 (0.71)	51 (2.01)	51 (2.01)	—
	No			44 (1.73)	7 (0.28)
M30 x 1.5	Yes	30 (1.18)	50 (1.97)	50 (1.97)	—
	No			40 (1.57)	10 (0.39)

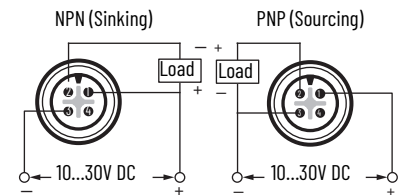
M12 Micro QD Style



Normally Open



Normally Closed



Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	60 (2.36)	41 (1.61)	—
	No			36 (1.42)	5 (0.2)
M18 x 1	Yes	18 (0.71)	63.5 (2.5)	42 (1.65)	—
	No			35 (1.38)	7 (0.28)
M30 x 1.5	Yes	30 (1.18)	63.5 (2.5)	42 (1.65)	—
	No			32 (1.26)	10 (0.39)

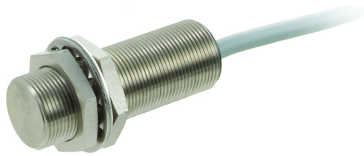
871TM 3-wire DC Long-range Sensing Tubular Sensors



871TM M8 Pico Quick Disconnection Style
8 mm Diameter



871TM DC M12 Micro Quick Disconnect Style
12 mm Diameter



871TM DC Cable Style
18 mm Diameter



871TM DC M12 Micro Quick Disconnect Style
30 mm Diameter



Specifications

Attribute	8 mm, 12 mm, 18 mm, and 30 mm Diameter
Load current	≤ 200 mA
Capacitive Load	≤ 1 mF
Leakage current	≤ 0.1 mA
Operating voltage	10...30V DC
Voltage drop	≤ 2V DC at 200 mA
Repeatability	≤ 5% at constant temperature
Hysteresis	10% typical
Protection type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	cULus Listed, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations
Enclosure type rating	<ul style="list-style-type: none"> 12 mm, 18 mm, 30 mm diameter models: IP68/IP69K 8 mm diameter quick disconnect models: IP67 8 mm diameter cable models: IP68
Housing material	Stainless steel face and threaded barrel
Connection type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length Quick disconnect: 4-pin micro style, 3-pin Pico style
Status indicators	Yellow: Output energized/360° status indicator visibility, flashing status indicator indicates target that is located between 80...100% of rated sensing distance
Operating temperature	-25...+70 °C (-13...+158 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes
IO-Link (Enabled on Normally Open, PNP Models Only)	
Protocol	IO-Link V1.1
Interface Type	IO-Link
Mode	COM2 (38.4 kBd)
Cycle Time, min ⁽¹⁾	8 ms
SIO (Standard I/O)	Supported (pin 4 for either IO-Link or standard I/O)

(1) These products have been tested to comply with IO-Link test specification IEC 61131-9. Environmental EMC and Physical Layer testing have not been performed with the device running in IO-Link mode.

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency [Hz]	Cat. No.		
						PUR Cable Style	M12 Micro QD Style	M8 Pico QD Style
8 (0.31)	3 (0.12)	Yes	N.O.	NPN	≤ 700	871TM-M3NN8-J2	871TM-M3NN8-D4	871TM-M3NN8-P3
				PNP		871TM-M3NP8-J2	871TM-M3NP8-D4	871TM-M3NP8-P3
	No	NPN		871TM-N6NN8-J2		871TM-N6NN8-D4	871TM-N6NN8-P3	
		PNP		871TM-N6NP8-J2		871TM-N6NP8-D4	871TM-N6NP8-P3	
	3 (0.12)	Yes	N.C.	NPN		871TM-M3CN8-J2	871TM-M3CN8-D4	871TM-M3CN8-P3
				PNP		871TM-M3CP8-J2	871TM-M3CP8-D4	871TM-M3CP8-P3
	No	NPN		871TM-N6CN8-J2		871TM-N6CN8-D4	871TM-N6CN8-P3	
		PNP		871TM-N6CP8-J2		871TM-N6CP8-D4	871TM-N6CP8-P3	
12 (0.47)	6 (0.23)	Yes	N.O.	NPN	400	871TM-M6NN12-A2	871TM-M6NN12-D4	—
				PNP		871TM-M6NP12-A2	871TM-M6NP12-D4	—
	No	NPN		871TM-N10NN12-A2		871TM-N10NN12-D4	—	
		PNP		871TM-N10NP12-A2		871TM-N10NP12-D4	—	
	6 (0.23)	Yes	N.C.	NPN		871TM-M6CN12-A2	871TM-M6CN12-D4	—
				PNP		871TM-M6CP12-A2	871TM-M6CP12-D4	—
	No	NPN		871TM-N10CN12-A2		871TM-N10CN12-D4	—	
		PNP		871TM-N10CP12-A2		871TM-N10CP12-D4	—	
18 (0.71)	10 (0.39)	Yes	N.O.	NPN	200	871TM-M10NN18-A2	871TM-M10NN18-D4	—
				PNP		871TM-M10NP18-A2	871TM-M10NP18-D4	—
	No	NPN		871TM-N20NN18-A2		871TM-N20NN18-D4	—	
		PNP		871TM-N20NP18-A2		871TM-N20NP18-D4	—	
	10 (0.39)	Yes	N.C.	NPN		871TM-M10CN18-A2	871TM-M10CN18-D4	—
				PNP		871TM-M10CP18-A2	871TM-M10CP18-D4	—
	No	NPN		871TM-N20CN18-A2		871TM-N20CN18-D4	—	
		PNP		871TM-N20CP18-A2		871TM-N20CP18-D4	—	
30 (1.18)	20 (0.79)	Yes	N.O.	NPN	80	871TM-M20NN30-A2	871TM-M20NN30-D4	—
				PNP		871TM-M20NP30-A2	871TM-M20NP30-D4	—
	No	NPN		871TM-N40NN30-A2		871TM-N40NN30-D4	—	
		PNP		871TM-N40NP30-A2		871TM-N40NP30-D4	—	
	20 (0.79)	Yes	N.C.	NPN		871TM-M20CN30-A2	871TM-M20CN30-D4	—
				PNP		871TM-M20CP30-A2	871TM-M20CP30-D4	—
	No	NPN		871TM-N40CN30-A2		871TM-N40CN30-D4	—	
		PNP		871TM-N40CP30-A2		871TM-N40CP30-D4	—	
Recommended cordset: 2 m (6.5 ft) 4-pin DC micro (straight)						889D-F4AC-2	889P-F3AB-2	

Correction Factors

Instructions for unshielded sensor:

- To determine the appropriate correction factor, only use [Table 6 on page 48](#).
- To determine derated sensing distance (if applicable), multiply the sensor type with the target material by the sensing range.

Instructions for shielded sensor:

- To determine the appropriate correction factor, use [Table 6 on page 48](#) and [Table 7 on page 48](#).
- In [Table 6 on page 48](#), determine the appropriate correction factor, based on the type and the target material.
- In [Table 7 on page 48](#), multiply the result from [Table 6 on page 48](#) by the material the sensor is mounted in. The result is the final correction factor.

Table 6 - Sensor Type and Target Material Correction Factor

Sensor Type/ Target Material (No Surrounding Metal)	8 mm Diameter		12 mm Diameter		18 mm Diameter		30 mm Diameter	
	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded
Steel	1	1	1	1	1	1	1	1
Copper	0.90	0.85	0.85	0.80	0.80	0.90	0.90	0.90
Aluminum	1	1	1	1	1	1	1	1
Brass	1.35	1.4	1.3	1.4	1.2	1.35	1.3	1.2
Stainless steel	0.3/0.6	0.3/0.9	0.5/0.9	NA/0.65	0.5/0.9	0.2/0.7	0.35/0.7	NA/0.25

Table 7 - Surrounding Material

Surrounding Material Type	8 mm Diameter	12 mm Diameter	18 mm Diameter	30 mm Diameter
	Shielded			
Steel	1	0.7	0.75	0.9
Aluminum	0.9	1.15	0.9	0.7
Brass	0.9	1.05	0.75	0.6
Stainless steel	1	0.8	0.8	1.3

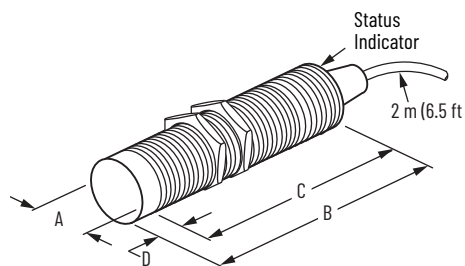
The [Table 8](#) indicates the protrusion distance from the mounting device for the unshielded sensor face.

Table 8 - Protrusion Distance

Surrounding Material Type	8 mm Diameter	12 mm Diameter	18 mm Diameter	30 mm Diameter
	Unshielded [mm (in.)]			
Steel	15 (0.59)	22 (0.87)	36 (1.42)	18 (0.71)
Aluminum	9 (0.35)	13 (0.51)	22 (0.87)	34 (1.34)
Brass	10 (0.39)	15 (0.59)	22 (0.87)	34 (1.34)
Stainless steel	14 (0.55)	21 (0.83)	43 (1.69)	18 (0.71)

Approximate Dimensions

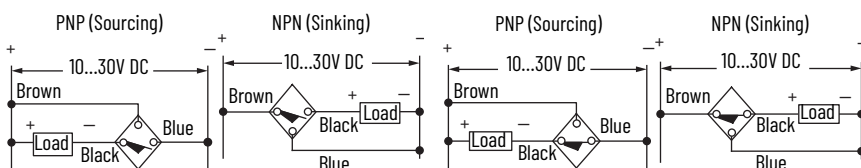
Cable Style



Wiring Diagrams

Normally Open

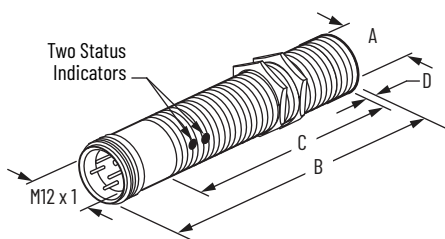
Normally Closed



Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M8 x 1	Yes	8 (0.31)	46 (1.81)	45 (1.76)	—
	No			41 (1.61)	4 (0.16)
M12 x 1	Yes	12 (0.47)	51 (2.01)	50 (1.96)	—
	No			45 (1.77)	5 (0.19)
M18 x 1	Yes	18 (0.71)	51 (2.01)	50 (1.96)	—
	No			43 (1.69)	7 (0.27)
M30 x 1.5	Yes	30 (1.18)	51 (2.01)	50 (1.96)	—
	No			40 (1.57)	10 (0.39)

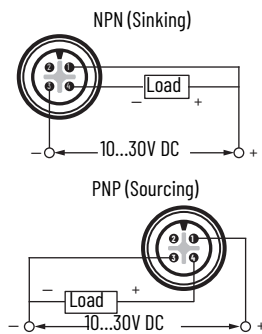
Approximate Dimensions

M12 Micro Style

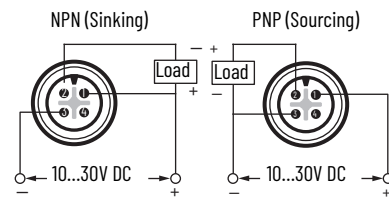


Wiring Diagrams

Normally Open

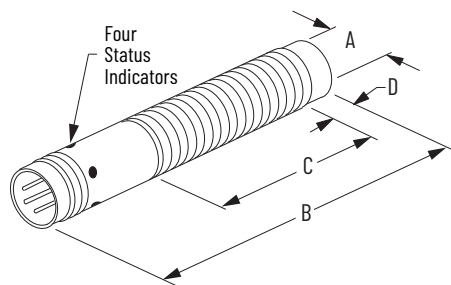


Normally Closed

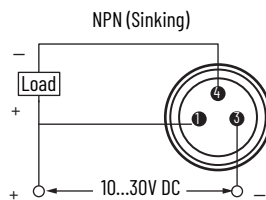


Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M8 x 1	Yes	8 (0.31)	66 (2.59)	46 (1.81)	—
	No			42 (1.65)	4 (0.16)
M12 x 1	Yes	12 (0.47)	60 (2.26)	41. (1.61)	—
	No			36 (1.42)	5 (0.19)
M18 x 1	Yes	18 (0.71)	63.5 (2.5)	42.5 (1.67)	—
	No			35.5 (1.4)	7 (0.27)
M30 x 1.5	Yes	30 (1.18)	63.5 (2.50)	42.5 (1.67)	—
	No			32.5 (1.28)	10 (0.39)

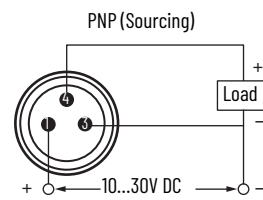
M8 Pico Style



Normally Open



Normally Closed



Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B (Max)	C (Min)	D (Max)
M8 x 1	Yes	8 (0.31)	60 (2.36)	46 (1.81)	—
	No			42 (1.65)	4 (0.16)

871TM 3-wire DC Ferrous Selective Tubular Sensors

Specifications



Attribute	12 mm Diameter
Load current	≤ 200 mA
Capacitive Load	≤ 1 μF
Leakage current	≤ 10 μA
Operating voltage	10...30V DC
Voltage drop	≤ 1V DC at 200 mA
Repeatability	≤ 10% at constant temperature
Hysteresis	10% typical
Protection type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	UL Listed, CSA Certified, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations
Enclosure type rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing material	Stainless steel face and threaded barrel
Connection type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length, A2 - 3-conductor PVC, C2 3-conductor 22 AWG ToughLink, H2 - 3-conductor 18 AWG ToughLink; Quick disconnect: 4-pin mini style, 4-pin micro style
Status indicators	Red: Output energized
Operating temperature	-25...+70 °C (-13...+158 °F)
Shock	30 g (1.05 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless steel	0...1.0 ⁽¹⁾
Brass	0.0
Aluminum	0.0
Aluminum (> 0.003 thick)	0.0
Copper	0.0

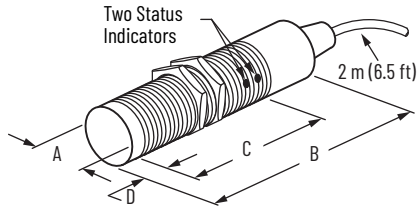
(1) Variations due to differences in alloy composition.

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency [Hz]	Cat. No.			
						PVC Cable	ToughLink Cable	Mini QD Style	Micro QD Style
12 (0.47)	1 (0.04)	Yes	N.O.	PNP	25	871TM-DF1NP12-A2	871TM-DF1NP12-C2	871TM-DF1NP12-N4	871TM-DF1NP12-D4
				NPN		—	871TM-DF1NN12-C2	871TM-DF1NN12-N4	871TM-DF1NN12-D4
			N.C.	PNP		—	—	871TM-DF1CP12-N4	871TM-DF1CP12-D4
				NPN		—	—	871TM-DF1CN12-N4	871TM-DF1CN12-D4

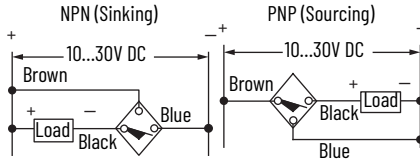
Approximate Dimensions

Cable Style

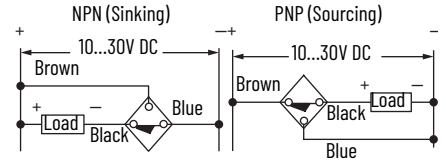


Wiring Diagrams

Normally Open

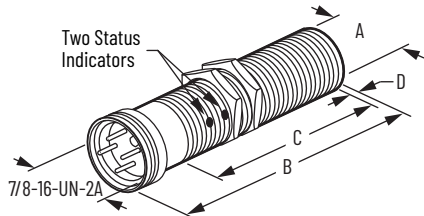


Normally Closed

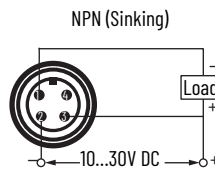


Thread Size	Shielded	Target Type	Dimensions [mm (in.)]			
			A	B	C	D
M12 x 1	Yes	Ferrous	12 (0.47)	51 (2.01)	27.5 (1.08)	—

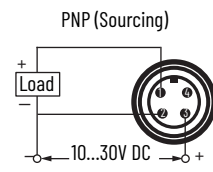
Mini QD Style



Normally Open

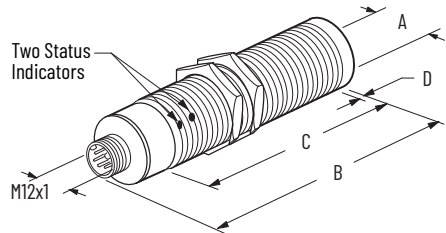


Normally Closed

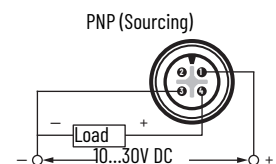
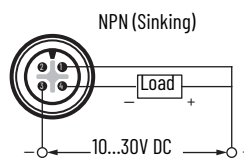


Thread Size	Shielded	Target Type	Dimensions [mm (in.)]			
			A	B	C	D
M12 x 1	Yes	Ferrous	12 (0.47)	61.3 (2.45)	30.4 (1.2)	—

Micro QD Style



Normally Open or Normally Closed



Thread Size	Shielded	Target Type	Dimensions [mm (in.)]			
			A	B	C	D
M12 x 1	Yes	Ferrous	12 (0.47)	62.3 (2.45)	30.4 (1.2)	0.9 (0.04)

871TM 2-wire DC Short Barrel Tubular Sensors

Specifications



871TM Cable Style
12 mm, 18 mm, and 30 mm Diameter



871TM Mini Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter



871TM DC M12 Micro
12 mm, 18 mm, and 30 mm Diameter

Attribute	12 mm, 18 mm, and 30 mm Diameter
Load current	≤ 25 mA
Load current, Minimum	2 mA
Leakage current	≤ 0.9 mA
Operating voltage	10...30V DC
Voltage drop	≤ 8V
Repeatability	10% typical
Hysteresis	10% typical
Protection type	False pulse, transient noise, reverse polarity, short circuit, overload
Certifications	UL Listed, CSA Certified, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations
Enclosure type rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing material	Stainless steel face and threaded barrel
Connection type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length, A2 - 2-conductor PVC, C2 - 2-conductor 22 AWG ToughLink, H2 - 2-conductor 18 AWG ToughLink Quick disconnect: 4-pin mini style, 4-pin M12 micro style
Status indicators	Red: Output energized
Operating temperature	-25...+70 °C (-13...+158 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

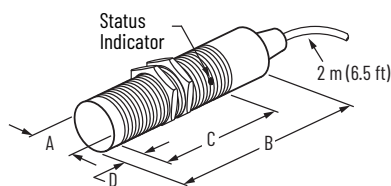
Target Material	Correction Factors
Steel	1.0
Stainless steel	0.9...1.0
Brass	0.3...0.5
Aluminum	0.1...0.4
Aluminum (≤ 0.02 thick)	0.9...1.1
Copper	0.1...0.2

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration	Switching Frequency [Hz]	Cat. No.			
					PVC Cable	ToughLink Cable	Mini QD Style	Micro QD Style
12 (0.47)	2 (0.08)	Yes	N.O.	75	871TM-DH2NE12-A2	871TM-DH2NE12-C2	871TM-DH2NE12-N4	871TM-DH2NE12-D4
	4 (0.16)	No			871TM-DH4NE12-A2	871TM-DH4NE12-C2	871TM-DH4NE12-N4	871TM-DH4NE12-D4
	2 (0.08)	Yes	N.C.	70	871TM-DH2CE12-A2	871TM-DH2CE12-C2	871TM-DH2CE12-N4	871TM-DH2CE12-D4
	4 (0.16)	No			871TM-DH4CE12-A2	871TM-DH4CE12-C2	871TM-DH4CE12-N4	871TM-DH4CE12-D4
18 (0.71)	5 (0.2)	Yes	N.O.	60	871TM-DH5NE18-A2	871TM-DH5NE18-H2	871TM-DH5NE18-N4	871TM-DH5NE18-D4
	8 (0.31)	No			871TM-DH8NE18-A2	871TM-DH8NE18-H2	871TM-DH8NE18-N4	871TM-DH8NE18-D4
	5 (0.2)	Yes	N.C.	40	871TM-DH5CE18-A2	871TM-DH5CE18-H2	871TM-DH5CE18-N4	871TM-DH5CE18-D4
	8 (0.31)	No			871TM-DH8CE18-A2	871TM-DH8CE18-H2	871TM-DH8CE18-N4	871TM-DH8CE18-D4
30 (1.18)	10 (0.39)	Yes	N.O.	40	871TM-DH10NE30-A2	871TM-DH10NE30-H2	871TM-DH10NE30-N4	871TM-DH10NE30-D4
	15 (0.59)	No			871TM-DH15NE30-A2	871TM-DH15NE30-H2	871TM-DH15NE30-N4	871TM-DH15NE30-D4
	10 (0.39)	Yes	N.C.	30	871TM-DH10CE30-A2	871TM-DH10CE30-H2	871TM-DH10CE30-N4	871TM-DH10CE30-D4
	15 (0.59)	No			871TM-DH15CE30-A2	871TM-DH15CE30-H2	871TM-DH15CE30-N4	871TM-DH15CE30-D4
Recommended standard QD cordset: -6F = 1.8 m (6 ft), -2 = 2 m (6.5 ft)							889N-F4AFC-6F	889D-F4AC-2

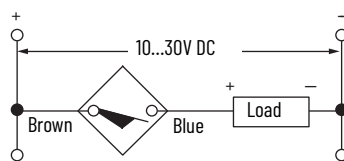
Approximate Dimensions

Cable Style

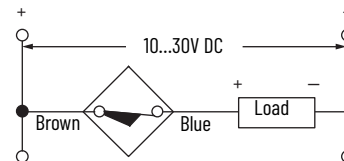


Wiring Diagrams

Normally Open

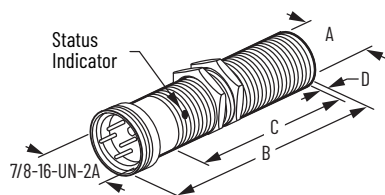


Normally Closed

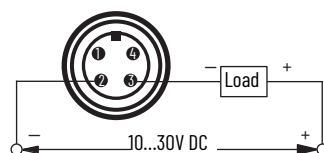


Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	49.8 (1.96)	26.4 (0.1)	2.5 (0.1)
	No			19.5 (0.77)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.1)
	No				14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

Mini QD Style



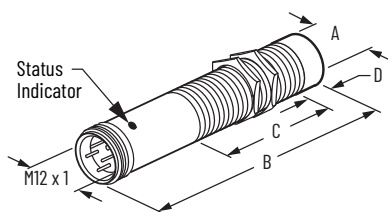
Normally Open or Normally Closed



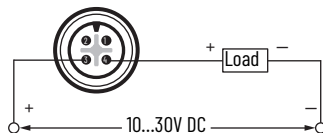
IMPORTANT Load can be switched to pin 2

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	63.5 (2.5)	25.4 (1)	2.5 (0.1)
	No			18.5 (0.73)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.1)
	No			29.2 (1.15)	14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	68.1 (2.68)	49.1 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

M12 Micro QD Style



Normally Open or Normally Closed



IMPORTANT Load can be switched to pin 3

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	61 (2.4)	26.4 (1.04)	2.5 (0.1)
	No			19.6 (0.77)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	65 (2.56)	41.7 (1.64)	2.5 (0.1)
	No				14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	66.3 (2.61)	41.9 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

871TM 2-wire AC/DC All Stainless Steel Tubular Sensors



871TM AC/DC Cable Style
12 mm, 18 mm, and 30 mm Diameter



871TM AC/DC Mini Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter



871TM AC Micro Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter



871TM AC/DC EAC M12 Micro Quick Disconnect Style
12 mm Diameter



871TM AC/DC ToughLink Cable Style
12 mm, 18 mm, and 20 mm Diameter

Specifications

Attribute	12 mm Diameter	18 mm and 30 mm Diameter
Load current	5...200 mA	5...250 mA
Inrush current (one cycle)	≤ 2 A	≤ 4 A
Leakage current	≤ 1.9 mA at 120V AC	
Operating voltage	20...250V AC/DC	
Voltage drop	≤ 10V at 5...200 mA	≤ 10V at 5...250 mA
Repeatability	≤ 10% at constant temperature	
Hysteresis	7% typical	
Protection type	False pulse, transient noise, short circuit (trigger at 5 A typical), and overload (trigger at 260 mA typical)	False pulse, transient noise, short circuit (trigger at 8 A typical), and overload (trigger at 320 mA typical)
Certifications	UL Listed, CSA Certified, CE Marked for all applicable directives, UKCA Marked for all applicable regulations, and CCC Certified (select models)	
Enclosure type rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)	
Housing material	Stainless steel face and threaded barrel	
Connection type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length; A2 - 2-conductor 22 AWG PVC, C2 - 2-conductor 22 AWG ToughLink, H2 - 3-conductor 18 AWG ToughLink Quick disconnect: 3-pin mini style, 3-pin micro style, 4-pin EAC M12 micro style 	
Status indicators	<ul style="list-style-type: none"> Red: Output energized Green: Power Short circuit: Red and green flashing 	
Operating temperature	-25...+70 °C (-13...+158 °F)	
Shock	30 g (1.06 oz), 11 ms	
Vibration	55 Hz, 1 mm amplitude, 3 planes	

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless steel	0.9...1.0
Brass	0.3...0.5
Aluminum	0.1...0.4
Aluminum (≤ 0.02 Thick)	0.9...1.1
Copper	0.1...0.2

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Config.	Switching Frequency [Hz]	Cat. No.				
					PVC Cable	ToughLink Cable	Mini QD	Micro QD	EAC Micro
12 (0.47)	3 (0.12)	Yes	N.O.	35	871TM-B3N12-A2 ⁽¹⁾	871TM-B3N12-C2	871TM-B3N12-N3	871TM-B3N12-R3	—
			N.C.	30	871TM-B3C12-A2 ⁽¹⁾	871TM-B3C12-C2	871TM-B3C12-N3	871TM-B3C12-R3	—
	4 (0.16)	No	N.O.	20	871TM-B4N12-A2 ⁽¹⁾	871TM-B4N12-C2	871TM-B4N12-N3	871TM-B4N12-R3	871TM-B4N12-B4 ⁽¹⁾
			N.C.	15	871TM-B4C12-A2	871TM-B4C12-C2	871TM-B4C12-N3	871TM-B4C12-R3	—
18 (0.71)	5 (0.2)	Yes	N.O.	20	871TM-B5N18-A2 ⁽¹⁾	871TM-B5N18-H2	871TM-B5N18-N3	871TM-B5N18-R3	—
			N.C.	15	871TM-B5C18-A2	871TM-B5C18-H2	871TM-B5C18-N3	871TM-B5C18-R3	—
	8 (0.31)	No	N.O.	15	871TM-B8N18-A2 ⁽¹⁾	871TM-B8N18-H2 ⁽¹⁾	871TM-B8N18-N3	871TM-B8N18-R3	—
			N.C.	12	871TM-B8C18-A2 ⁽¹⁾	871TM-B8C18-H2	871TM-B8C18-N3	871TM-B8C18-R3	—
30 (1.18)	10 (0.39)	Yes	N.O.	15	871TM-B10N30-A2 ⁽¹⁾	871TM-B10N30-H2	871TM-B10N30-N3	871TM-B10N30-R3	—
			N.C.	12	871TM-B10C30-A2	871TM-B10C30-H2	871TM-B10C30-N3	871TM-B10C30-R3	—
	15 (0.59)	No	N.O.	12	871TM-B15N30-A2 ⁽¹⁾	871TM-B15N30-H2 ⁽¹⁾	871TM-B15N30-N3 ⁽¹⁾	871TM-B15N30-R3 ⁽¹⁾	—
			N.C.	10	871TM-B15C30-A2 ⁽¹⁾	871TM-B15C30-H2	871TM-B15C30-N3	871TM-B15C30-R3	—

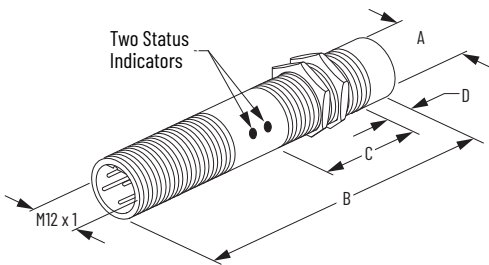
Recommended standard QD cordset: -6F = 1.8 m (6 ft), -2 = 2 m (6.5 ft)

889N-F3AFC-6F 889R-F3ECA-2 889B-F3AC-2

(1) CCC Certified

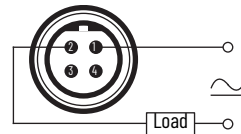
Approximate Dimensions

EAC M12 Micro QD Style



Wiring Diagrams

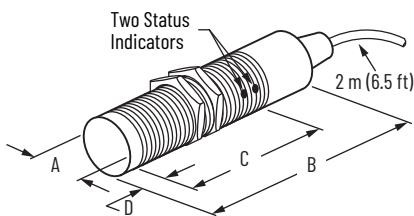
Normally Open



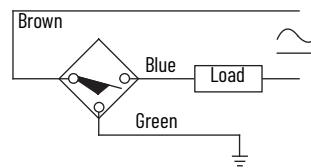
- IMPORTANT**
- No ground pin. Attach housing to ground.
 - Load can be switched to pin 2.

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	No	12 (0.47)	83 (3.27)	31.7 (1.25)	9.4 (0.37)

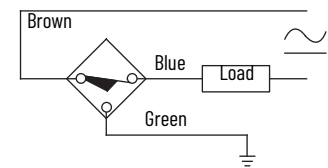
Cable Style



Normally Open



Normally Closed

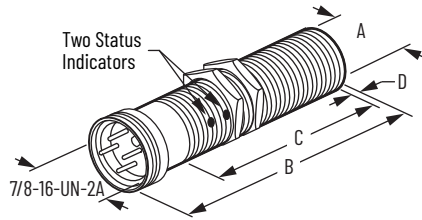


- IMPORTANT**
- No green wire on 12 mm and on sensors with PVC cable (-A2). Attach housing to ground.
 - Load can be switched to brown wire.

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	72.1 (2.84)	38.4 (1.51)	2.5 (0.1)
	No			31.5 (1.24)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	74.7 (2.94)	60 (2.35)	2.5 (0.1)
	No			48.2 (1.9)	14.4 (0.56)
M30 x 1.5	Yes	30 (1.18)	77.2 (3.04)	61.3 (2.41)	2.5 (0.1)
	No			46.1 (1.81)	17.9 (0.7)

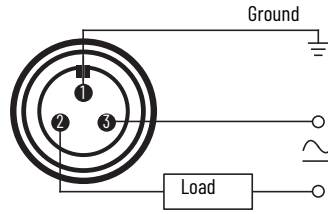
Approximate Dimensions

Mini QD Style



Wiring Diagrams

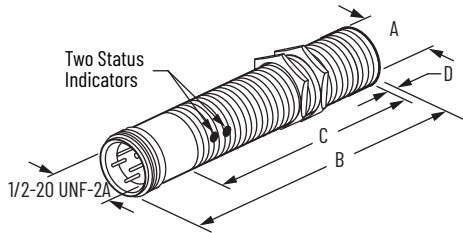
Normally Open or Normally Closed



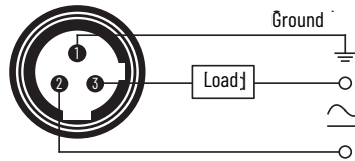
- IMPORTANT**
- No ground pin on 12 mm. Attach housing to ground.
 - Load can be switched to pin3

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	85.6 (3.37)	37.8 (1.49)	2.5 (0.1)
	No			31.7 (1.25)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	56.1 (2.21)	54.9 (2.16)	2.5 (0.1)
	No			43.1 (1.7)	14.4 (0.56)
M30 x 1.5	Yes	30 (1.18)	68.1 (2.68)	61.3 (2.41)	2.5 (0.1)
	No			46.1 (1.81)	17.9 (0.7)

AC Micro QD Style



Normally Open or Normally Closed



- IMPORTANT**
- No ground pin on 12 mm. Attach housing to ground.
 - Load can be switched to pin 2

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	83.4 (3.28)	38.4 (1.51)	2.5 (0.1)
	No			31.5 (1.24)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	84.3 (3.32)	60 (2.36)	2.5 (0.1)
	No			48.2 (1.9)	14.4 (0.56)
M30 x 1.5	Yes	30 (1.18)	85.7 (3.37)	61.3 (2.41)	2.5 (0.1)
	No			46.1 (1.81)	17.9 (0.7)

871TM 2-wire AC/DC PLC Interfacer



871TM AC/DC Cable Style
12 mm, 18 mm, and 30 mm Diameter



871TM AC/DC Mini Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter



871TM AC Micro Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter



871TM AC/DC EAC M12 Micro Quick Disconnect Style
12 mm Diameter



871TM AC/DC ToughLink Cable Style
12 mm, 18 mm, and 30 mm Diameter

Specifications

Attribute	12 mm, 18 mm, and 30 mm Diameter
Load current	2...25 mA
Leakage current	≤ 0.9 mA at 24V DC ≤ 1.7 mA at 20...120V AC/DC ≤ 2.5 mA at 121...250V AC/DC
Operating voltage	20...250V AC/DC (standard models) 20...132V AC/DC (high temperature models)
Voltage drop	≤ 8V at 25 mA DC ≤ 10V at 25 mA AC
Repeatability	10% typical
Hysteresis	10% typical
Protection type	False pulse, transient noise, radio frequency (10V per meter, frequency range 20...1000 MHz) ⁽¹⁾
Certifications	UL Listed, CSA Certified, CE Marked for all applicable directives, UKCA Marked for all applicable regulations, and CCC Certified (select models)
Enclosure type rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing material	Stainless steel face and threaded short barrel
Connection type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length, A2 - 2-conductor 22 AWG PVC, C2 - 2-conductor 22 AWG ToughLink, H2 - 2-conductor 18 AWG ToughLink Quick disconnect: 3-pin mini style, 3-pin micro style, 4-pin EAC M12 micro style
Status indicators	Red: Output energized
Operating temperature	-25...+70 °C (-13...+158 °F) (standard models) 0...100 °C (32...212 °F) (high temperature models)
Shock	30 g (1.06 oz), 11 ms (standard models) 5 g (0.18 oz), 11 ms (high temperature models)
Vibration	55 Hz, 1 mm amplitude, 3 planes (standard models) 30...120 Hz, 1 mm amplitude, 3 planes (high temperature models)

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless steel	0.8...1.0
Brass	0.4...0.7
Aluminum	0.4...0.7
Copper	0.1...0.2

(1) Radio frequency protection is not available on high temperature models.

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Config.	Switching Frequency [Hz]	Cat. No.				
					PVC Cable	ToughLink Cable	Mini QD	Micro QD	EAC Micro
12 (0.47)	2 (0.08)	Yes	N.O.	75	871TM-BH2N12-A2 ⁽¹⁾	871TM-BH2N12-C2 ⁽¹⁾	871TM-BH2N12-N3 ⁽¹⁾	871TM-BH2N12-R3 ⁽¹⁾	871TM-BH2N12-B4 ⁽¹⁾
	4 (0.16)	No		35	871TM-BH4N12-A2 ⁽¹⁾	871TM-BH4N12-C2	871TM-BH4N12-N3	871TM-BH4N12-R3	—
	2 (0.08)	Yes	N.C.	75	—	—	—	871TM-BH2C12-R3	—
	4 (0.16)	No		35	—	—	—	871TM-BH4C12-R3	—
18 (0.71)	5 (0.2)	Yes	N.O.	65	871TM-BH5N18-A2 ⁽¹⁾	871TM-BH5N18-H2	871TM-BH5N18-N3 ⁽²⁾	871TM-BH5N18-R3	—
	8 (0.31)	No		30	871TM-BH8N18-A2 ⁽¹⁾	871TM-BH8N18-H2 ⁽³⁾	871TM-BH8N18-N3 ⁽⁴⁾	871TM-BH8N18-R3	—
	5 (0.2)	Yes	N.C.	65	—	—	—	871TM-BH5C18-R3	—
	8 (0.31)	No		30	—	—	—	871TM-BH8C18-R3	—
30 (1.18)	10 (0.39)	Yes	N.O.	45	871TM-BH10N30-A2 ⁽¹⁾	871TM-BH10N30-H2	871TM-BH10N30-N3 ⁽⁵⁾	871TM-BH10N30-R3 ⁽¹⁾	—
	15 (0.59)	No		20	871TM-BH15N30-A2 ⁽¹⁾	871TM-BH15N30-H2	871TM-BH15N30-N3	871TM-BH15N30-R3	—
	10 (0.39)	Yes	N.C.	45	871TM-BH10C30-A2	871TM-BH10C30-H2	871TM-BH10C30-N3	871TM-BH10C30-R3	—
	15 (0.59)	No		20	871TM-BH15C30-A2	871TM-BH15C30-H2	871TM-BH15C30-N3	871TM-BH15C30-R3	—
Recommended standard QD cordset: -6F = 1.8 m (6 ft), -2 = 2 m (6.5 ft)							889N-F3AFC-6F	889R-F3ECA-2	889B-F3AC-2

(1) CCC Certified

(2) For a high temperature model, order Cat. No. 871TM-BX21-N3

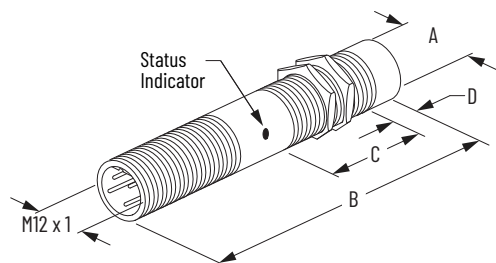
(3) For a high temperature model, order Cat. No. 871TM-BX22-H2

(4) For a high temperature model, order Cat. No. 871TM-BX22-N3

(5) For a high temperature model, order Cat. No. 871TM-BX23-N3

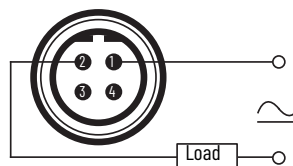
Approximate Dimensions

EAC M12 Micro QD Style



Wiring Diagrams

Normally Open

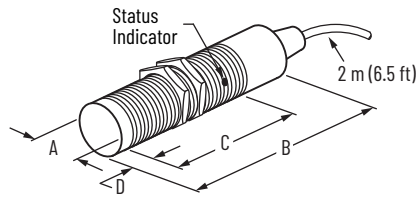


- IMPORTANT**
- No ground pin. Attach housing to ground.
 - Load can be switched to pin 2.

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	No	12 (0.47)	61 (2.4)	26.4 (1.04)	2.5 (0.1)

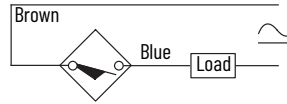
Approximate Dimensions

Cable Style



Wiring Diagrams

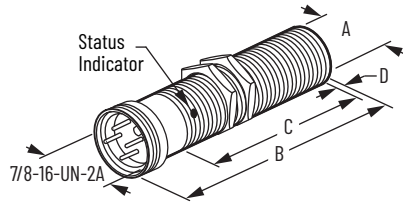
Normally Open



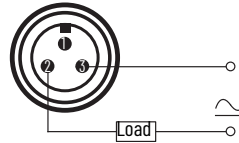
- IMPORTANT**
- Attach housing to ground.
 - Load can be switched to brown wire.

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	49.8 (1.96)	26.4 (1.04)	2.5 (0.1)
	No			19.5 (0.77)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.1)
	No				14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

Mini QD Style



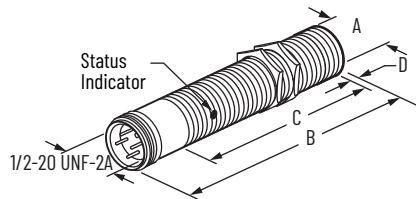
Normally Open



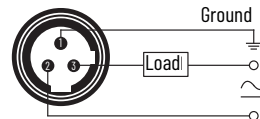
- IMPORTANT**
- Attach housing to ground.
 - Load can be switched to pin3.

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	63.5 (2.5)	25.4 (1)	2.5 (0.1)
	No			18.5 (0.73)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.1)
	No			29.2 (1.15)	14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	68.1 (2.68)	49.1 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

Micro QD Style



Normally Open or Normally Closed



- IMPORTANT**
- No ground pin on 12 mm. Attach housing to ground.
 - Load can be switched to pin 3.

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	83.4 (3.28)	26.4 (1.04)	2.5 (0.1)
	No			19.6 (0.77)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	84.3 (3.32)	41.7 (1.64)	2.5 (0.1)
	No				14.5 (0.57)
M30 x 1.5	Yes	30 (1.18)	85.7 (3.37)	41.9 (1.65)	2.5 (0.1)
	No			39.4 (1.55)	18 (0.71)

871TM 2-wire DC Intrinsically Safe

Specifications



871TM Intrinsically Safe Cable Style



871TM Intrinsically Safe M12 Micro Quick Disconnect Style 12 mm, 18 mm, and 30 mm Diameter



871TM Intrinsically Safe ToughLink Cable Style 12 mm Diameter

Attribute	12 mm, 18 mm, and 30 mm Diameter
Outputs	Normally open
Load current, max	25 mA
Load current, min	2 mA
Leakage current	$t \leq 1.0$ mA
Operating voltage	10...31.5V DC
Voltage drop	$\leq 8V$ DC
Repeatability	10% typical
Hysteresis	10% typical
Protection type	False pulse, transient noise, reverse polarity, short circuit, overload
Certifications	FM Approved and CSA Certified for: <ul style="list-style-type: none"> Class I, II, III; Divisions 1, 2; Groups A, B, C, D, E, F, G when used with an approved intrinsic safety barrier Class I, II, III; Division 2; Groups A, B, C, D, E, F, G without intrinsic safety barrier UL Listed for use in non-hazardous locations See control drawing 75001-437 or Division 1 Installation Wiring Diagrams on page 62 for approval details and wiring diagrams.
Enclosure type rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; stainless steel face and barrel; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing material	Stainless steel face and barrel
Connection type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length, A2 - 2 conductor 22 AWG PVC, C2 - 2 conductor 22 AWG ToughLink, H2 - 2 conductor 18 AWG ToughLink Quick disconnect: 4-pin micro style
Status indicators	Red: Output energized
Operating temperature	-25...+70 °C (-13...+158 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless steel	0.9...1.0
Brass	0.3...0.5
Aluminum	0.1...0.4
Aluminum (≤ 0.02 thick)	0.9...1.1
Copper	0.1...0.2

Entity Parameters

Sensor			Barrier
V_{MAX}	31.5V	\geq	V_t
I_{MAX}	130 mA	\geq	I_t
P_{MAX}	1.25 W	\geq	P_t
C_i	0 μ f	\leq	C_a
L_i	0 mH	\leq	L_{ta}

IMPORTANT Operating parameters must be adhered to.

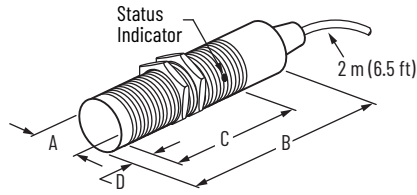
Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration	Switching Frequency [Hz]	Cat. No.		
					PVC Cable	ToughLink Cable	Micro QD Style
12 (0.47)	2 (0.08)	Yes	N.O.	75	871TM-DR2NE12-A2	871TM-DR2NE12-C2	871TM-DR2NE12-D4
	4 (0.16)	No			871TM-DR4NE12-A2	871TM-DR4NE12-C2	871TM-DR4NE12-D4
18 (0.71)	5 (0.2)	Yes		60	871TM-DR5NE18-A2	871TM-DR5NE18-H2	871TM-DR5NE18-D4
	8 (0.31)	No			871TM-DR8NE18-A2	871TM-DR8NE18-H2	871TM-DR8NE18-D4
30 (1.18)	10 (0.39)	Yes		40	871TM-DR10NE30-A2	871TM-DR10NE30-H2	871TM-DR10NE30-D4
	15 (0.59)	No			871TM-DR15NE30-A2	871TM-DR15NE30-H2	871TM-DR15NE30-D4
Recommended standard QD cordset: -2 = 2 m (6.5 ft)							889D-F4LC-2

IMPORTANT The sensor output is designed and approved as Intrinsically Safe for use in Division 1, 2; Class I, II, III; Groups A, B, C, D, E, F, G hazardous location areas when used with a Cat. No. 937ZH-DPBN-1 or 937ZH-DPDP-2 Intrinsically Safe Zener Barrier or can be used in Division 2 locations without a barrier. Installation must be in accordance with the National Electrical Code, ANSI/ISA RP12.6, or per other regulations by the authority having jurisdiction over the installation site as appropriate.

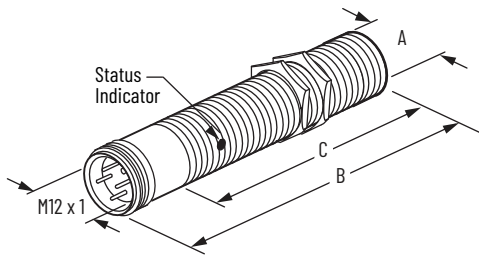
Approximate Dimensions

Cable Style



Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	72.1 (2.84)	36.1 (1.42)	2.5 (0.1)
	No			29.2 (1.15)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	75.7 (2.94)	56.2 (1.22)	2.5 (0.1)
	No			44.5 (1.75)	14.4 (0.56)
M30 x 1.5	Yes	30 (1.18)	77.2 (3.04)	58.4 (2.3)	2.5 (0.1)
	No			43.2 (1.7)	17.9 (0.7)

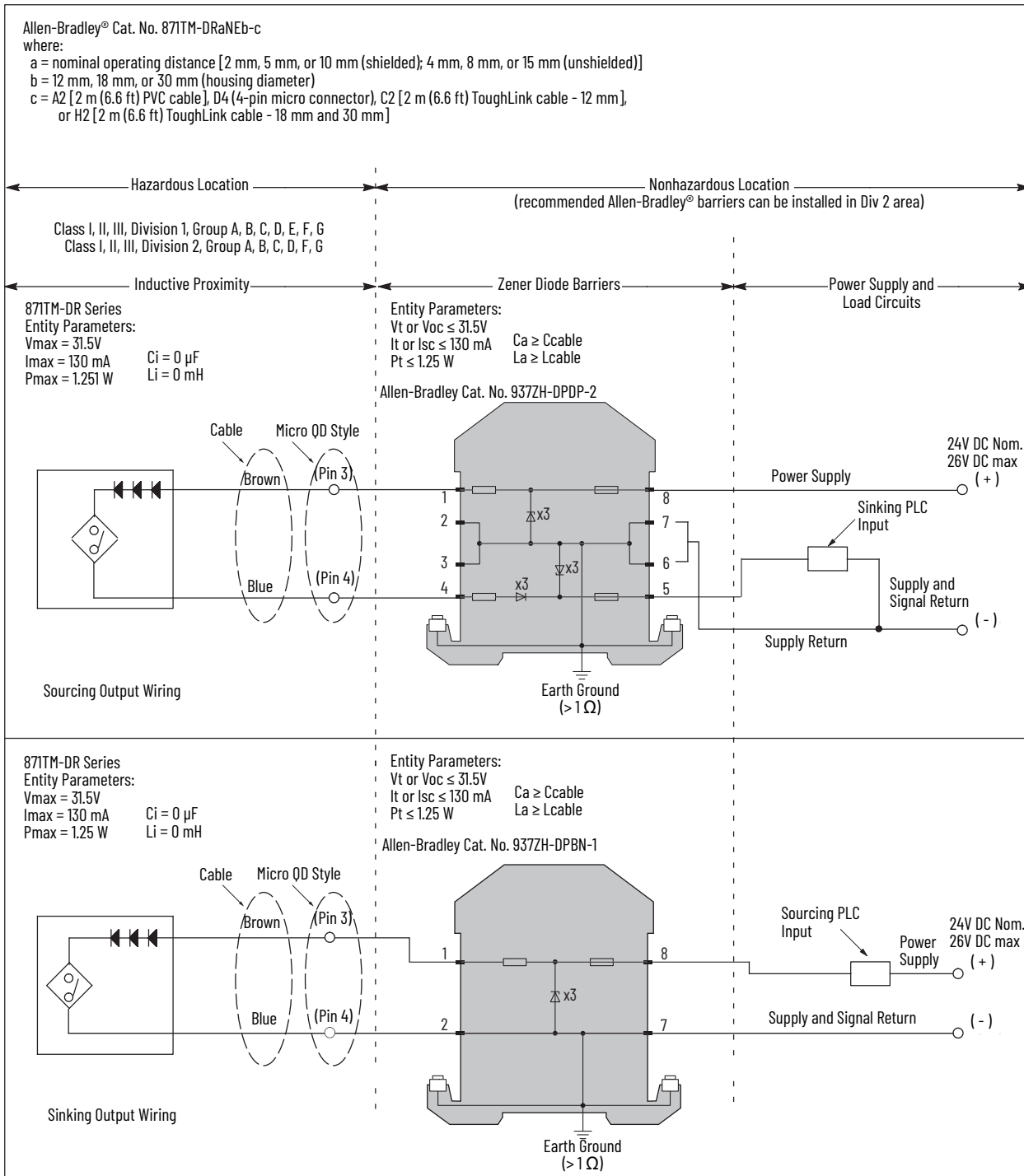
M12 Micro QD Style



Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	83.3 (3.28)	36.1 (1.42)	2.5 (0.1)
	No			29.2 (1.15)	9.4 (0.37)
M18 x 1	Yes	18 (0.71)	84.3 (3.32)	56.3 (22.2)	2.5 (0.1)
	No			44.5 (1.75)	14.4 (0.56)
M30 x 1.5	Yes	30 (1.18)	86.1 (3.39)	58.4 (2.3)	2.5 (0.1)
	No			43.2 (1.7)	17.9 (0.7)

Division 1 Installation Wiring Diagrams

Figure 59 - Wiring Diagram (a)

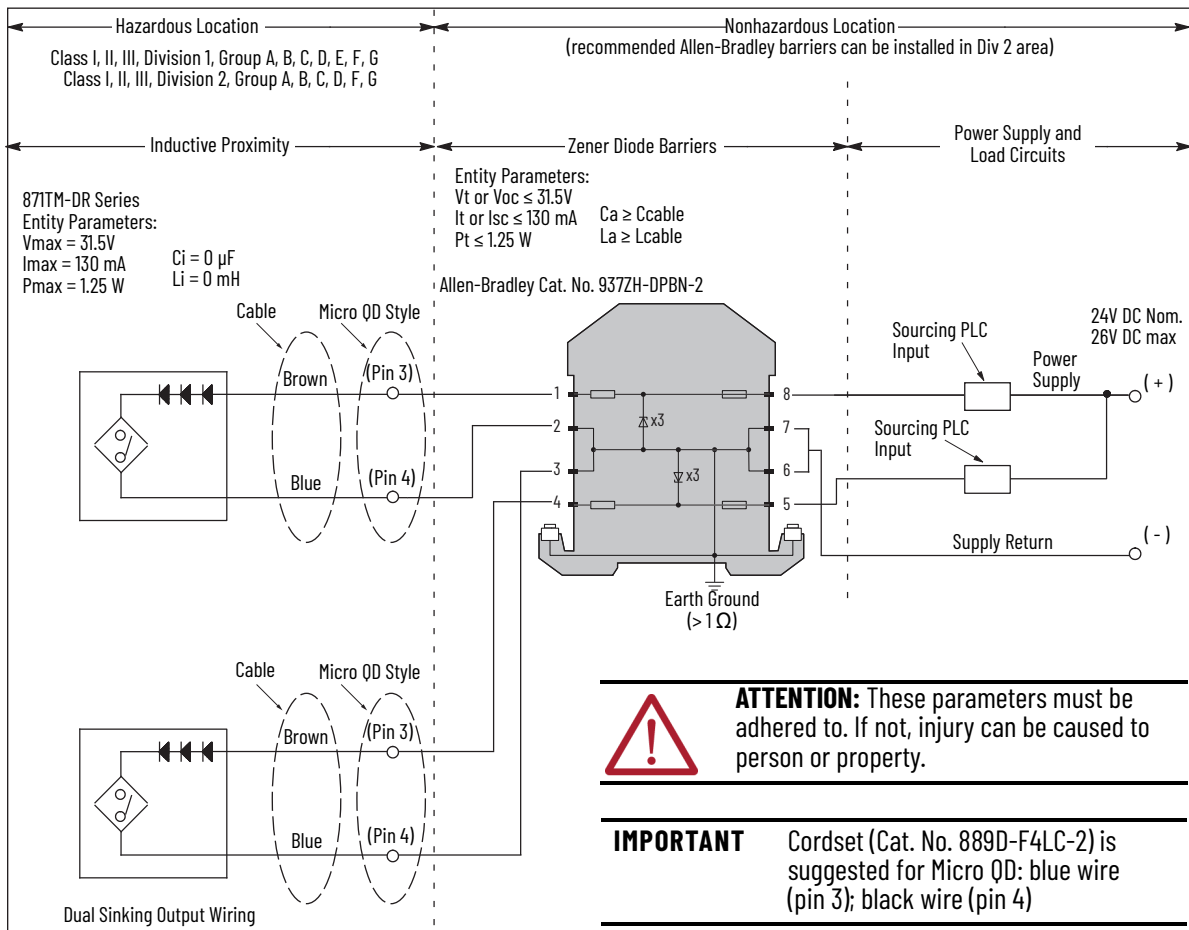


ATTENTION: These parameters must be adhered to. If not, injury may be caused to person or property.

IMPORTANT Cordset (Cat. No. 889D-F4LC-2) is suggested for Micro QD: blue wire (pin 3); black wire (pin 4)

(a) From control drawing [75001-437](#).

Figure 60 - Wiring Diagram, Continued (a)



Factory Mutual Installation Notes

1. Installation must be in accordance with the National Electrical Code (NFPA 70, Article 504), ANSI/ISA-RP12.6, and manufacturer instructions.
2. If the electrical parameters of the cable that is used are unknown, the following values can be used: Capacitance – 60 pF/ft.; Inductance – 0.20 μH/ft.
3. The wiring between each Inductive Proximity Sensor and its corresponding channel of the dual-channel barrier is a separate intrinsically safe circuit. Each of the two separate intrinsically safe circuits shall be in separate cables or shall be separated from each other as specified in NEC 504-30. The supply return conductors may be connected at the grounding terminal of the barrier.
4. The Barrier bus must be insulated from other grounded metal. Use Power Rail 937A-PR08, 937A-PR20, and Power Feed Module 937A-PSFD.
5. The maximum nonhazardous location voltage must not exceed 250V AC or DC.
6. Barriers are not required for Division 2 (31.5V DC max). Division 2 applications must be installed in accordance with the NEC.



WARNING: Substitution of components can impair Intrinsic Safety.

7. No revision to the drawing without prior FMRC approval.

(a) From control drawing [75001-437](#).

Canadian Standards Association Installation Notes

1. Installation must be in accordance with the Canadian Electrical Code (Part I), ANSI/ISA-RP12.6, and manufacturer instructions.
2. If the electrical parameters of the cable that is used are unknown, the following values can be used: Capacitance –60 pF/ft.; Inductance – 0.20 μ H/ft.
3. The wiring between each Inductive Proximity Sensor and its corresponding channel of the dual-channel barrier is a separate intrinsically safe circuit. Each of the two separate intrinsically safe circuits shall be in separate cables or shall be separated from each other as specified in CEC. The supply return conductors may be connected at the grounding terminal of the barrier.
4. The Barrier bus must be insulated from other grounded metal. Use Power Rail 937A-PR08, 937A-PR20, and Power Feed Module 937A-PSFD.
5. The maximum nonhazardous location voltage must not exceed 250V AC or DC.
6. Barriers are not required for Division 2 (31.5V DC max). Division 2 applications must be installed in accordance with the CEC.
7. In Division 2 applications without barriers, observe the following warnings:



WARNING: EXPLOSION HAZARD. Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.



WARNING: Substitution of components can impair Intrinsic Safety.

8. No revision to the drawing without prior CSA approval.